

CLAIMS

1. A dense mortar which comprises:

5 (i) an ettringite binder comprising calcium sulphates and a calcium
aluminates mineral compound, the calcium aluminates mineral compound
comprising oxides of calcium C and of aluminium A, which are soluble and
combined in one or several crystallized and/or amorphous mineralogical
phases in such proportions that:
10 - the useful C/A molar ratio of the calcium aluminates mineral compound
is in the range of 1.2 to 2.7;
- the sum in weight of the useful (C+A) phases represents at least 30% of
the total weight of the mineral compound,
(ii) at least one poly(alkylene oxide) comb polymer (PCP) and,
(iii) at least one structuring organic resin,
15 characterised in that the mortar contains less than 2% by weight
of said structuring organic resin.

2. A dense mortar according to claim 1, characterised in that the
mortar comprises at least 0.3% by weight of structuring organic resin,
20 based on the weight of the mortar.

3. A dense mortar according to claims 1 or 2, characterised in that
the mortar comprises 0.05% to 0.3% of poly(alkylene oxide) comb polymer
(PCP), preferably, 0.1% to 0.2% of poly(alkylene oxide) comb polymer
25 (PCP); based on the weight of the mortar.

4. A dense mortar according to any one of the claims 1 to 3,
characterised in that said structuring organic resin account for 1% by
weight of the mortar, or less.
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5. A dense mortar according to any one of the claims 1 to 4
characterised in that the poly(alkylene oxide) comb polymer (PCP) is
chosen from among the copolymers of carboxylic acids and carboxylic
esters of poly(alkylene glycol), copolymers of carboxylic acids and
35 poly(alkylene glycol) amide, copolymers of carboxylic acids and

poly(alkylene glycol) imide, copolymers of carboxylic acids and vinylic ethers of poly(alkylene glycol), either neutralised or not neutralised, and mixtures of thereof.

5 6. A dense mortar according to any one of the claims 1 to 5 characterised in that the structuring organic resin comprises at least one polymer selected from among poly(vinyl acetate), powdered copolymers of vinyl and ethylene acetate (EVA), copolymers formed by copolymerisation of 2 or more monomers selected from among ethylene, vinyl acetate, vinyl 10 esters of versatic acids, vinyl chloride, vinyl laurate, styrene, butadiene, alkyl acrylate, alkyl methacrylate, maleic anhydride and its derivatives.

15 7. A dense mortar according to claim 6 characterised in that it comprises 0.2% by weight of the mortar, of at least one poly(alkylene oxide) comb polymer (PCP) and 1% by weight of the mortar of at least one powdered copolymer of vinyl and ethylene acetate (EVA).

20 8. A dense mortar according to any one of the claims 1 to 5 characterised in that the structuring organic resin comprises at least one polyvinyl alcohol (PVA), possibly altered by the inclusion of carboxylic acid groups in its structure.

25 9. A dense mortar according to claim 8 characterised in that it comprises 0.2% by weight of the mortar, of at least one poly(alkylene oxide) comb polymer (PCP) and 1% by weight of mortar of at least one polyvinyl alcohol (PVA).

30 10. A dense mortar according to any one of the claims 1 to 9 characterised in that the weight ratio of calcium aluminate mineral compound /calcium sulphate within the ettringite binder is comprised between 0.5 and 4, and preferably between 1.5 and 3.

35 11. A dense mortar according to any one of the claims 1 to 10 characterised in that the molar ratio of calcium sulphate/aluminium oxide A in the ettringite binder is comprised between 0.5 and 2.

12. A dense mortar according to any one of the claims 1 to 11 characterised in that the molar ratio of useful mineral compound calcium aluminates/calcium sulphate within the ettringite binder is comprised between 1.3 and 2.5, and preferably between 1.6 and 2.

5 13. A dense mortar according to any one of the claims 1 to 12 characterised in that the useful C/A molar ratio of the calcium aluminates mineral compound in the ettringite binder is comprised between 0.6 and 1.8, and preferably between 0.8 and 1.7.

10 14. A dense mortar according to any one of the claims 1 to 13 characterised in that it exhibits at the time of mixing with water a water/solids weight ratio lower than 0.5.

15 15. A dense mortar according to any one of the claims 1 to 14, characterised in that it does not comprises any Portland cement or hydraulic lime, or comprises Portland cement and/or hydraulic lime at a content of less than 3.5% by weight based on the total weight of dry mortar.

20 16. A dense mortar according to any one of the claims 1 to 15, characterised in that the sum in weight of useful (C+A) phases accounts for at least 50% by weight of the total weight of the calcium aluminates mineral compound.

25 17. A dense mortar according to any one of the claims 1 to 16, characterised in that the calcium aluminates mineral compound is obtained through baking in a furnace at a temperature of over 1100°C, in the form of one or several melted or sintered clinkers that may contain 30 crystallised phases or amorphous phases.

35 18. A dense mortar according to any one of the claims 1 to 17, characterised in that the calcium aluminates mineral compound is under the form of a crystallised mineralogical phase selected from among CA, C12A7, C3A, C4A3\$ or under the form of an amorphous phase or under

the form of a mixture of at least one of said crystallised mineralogical phases and an amorphous phase.

19. A dense mortar according to the claim 18 characterised in that
5 the calcium aluminates mineral compound contains at least 30% by weight of C12A7, preferably at least 50% by weight of C12A7, more preferably from 50% to 85% by weight of C12A7 based on the total weight of the mineral compound.
- 10 20. A dense mortar according to any one of the claims 1 to 19 characterised in that the calcium aluminates mineral compound contains at least one crystallised mineralogical phase selected from among C2A(1-x)Fx, C2S, C2AS, C3S and mixtures thereof, where x is an integer belonging to]0; 1].
- 15 21. A dense mortar according to any one of the claims 1 to 20 characterised in that the calcium aluminates mineral compound is ground and exhibits a Blaine surface area greater than or equal to 1500 cm²/g.
- 20 22. A dense mortar according to the claim 21 characterised in that the calcium aluminates mineral compound is ground to a Blaine surface area comprised between 2000 cm²/g and 5000 cm²/g.
- 25 23. A dense mortar according to any one of the claims 1 to 22, characterised in that the calcium sulphate is derived from a compound selected from among anhydrites, semi-hydrates, gypsum and mixtures thereof.
- 30 24. A dense mortar according to one of the claims 1 to 23, characterised in that it comprises furthermore:
 - chalk fillers or siliceous sands: from 25 to 85% by weight based on the total weight of the dry mortar,
 - lime and/or Portland cement: from 0% to 3.5% by weight based on the total weight of the dry mortar, and

- complementary rheological additives and/or setting regulating additives.

25. A dense mortar according to claim 24, characterised in that it
5 contains:

- chalk fillers or siliceous sands: from 50 to 80% by weight based on the total weight of the dry mortar,

- lime and/or Portland cement: from 0% to 0.5% by weight based on the total weight of the dry mortar, and

10 - complementary rheological additives and/or setting regulating additives.

26. A dense mortar according to the claims 24 or 25 characterised in that the rheological additives account for from 0.1% to 0.5% of the total
15 weight of the dry mortar, and the setting regulating additives account for 0.1% to 0.5% of the total weight of the dry mortar.

27. A dense mortar according to any one of the claims 1 to 26 characterised in that it is obtained by mixing with water in a quantity such
20 that the water/solid weight ratio is less than 0.5.

28. The use of a poly(alkylene oxide) comb polymer (PCP) for the formulation of a mortar according to any one of the claims 1 to 27.